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By Elizabeth Royte
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A Tall, Cool Drink of … Sewage?

Before I left New York for California, where I planned to visit a water-recycling plant, I mopped my kitchen floor. Afterward, I emptied the bucket of dirty water into the toilet and watched as the foamy mess swirled away. This was one of life's more mundane moments, to be sure. But with water infrastructure on my mind, I took an extra moment to contemplate my water's journey through city pipes to the wastewater-treatment plant, which separates solids and dumps the disinfected liquids into the ocean.

A day after mopping, I gazed balefully at my hotel toilet in Santa Ana, Calif., and contemplated an entirely new cycle. When you flush in Santa Ana, the waste makes its way to the sewage-treatment plant nearby in Fountain Valley, then sluices not to the ocean but to a plant that superfilters the liquid until it is cleaner than rainwater. The "new" water is then pumped 13 miles north and discharged into a small lake, where it percolates into the earth. Local utilities pump water from this aquifer and deliver it to the sinks and showers of 2.3 million customers. It is now drinking water. If you like the idea, you call it indirect potable reuse. If the idea revolts you, you call it toilet to tap.

Opened in January, the Orange County Groundwater Replenishment System is the largest of its type in the world. It cost $480 million to build, will cost $29 million a year to run and took more than a decade to get off the ground. The stumbling block was psychological, not architectural. An aversion to feces is nearly universal, and as critics of the process are keen to point out, getting sewage out of drinking water was one of the most important public health advances of the last 150 years.

Still, Orange County forged ahead. It didn't appear to have a choice. Saltwater from the Pacific Ocean was entering the county's water supply, drawn in by overpumping from the groundwater basin, says Ron Wildermuth, who at the time we talked was the water district's spokesman.

Moreover, population growth meant more wastewater, which meant building a second sewage pipe, five miles into the Pacific — a $200 million proposition. Recycling the effluent solved the disposal problem and the saltwater problem in one fell swoop. A portion of the plant's filtered output is now injected into the ground near the coast, to act as a pressurized barrier against saltwater from the ocean. Factor in Southern California's near chronic drought, the county's projected growth (another 300,000 to 500,000 thirsty people by 2020) and the rising cost of importing water from the Colorado River and from Northern California (the county pays $530 per acre-foot of imported water, versus $520 per acre-foot of reclaimed water), and rebranding sewage as a valuable resource became a no-brainer.

With the demand for water growing, some aquifers dropping faster than they're replenished, snowpacks thinning and climate change predicted to make dry places even drier, water managers around the country, and the world, are contemplating similar schemes. Los Angeles and San Diego, which both rejected potable reuse, have raised the idea once again, as have, for the first time, DeKalb County, Ga., and Miami-Dade County, Fla.

While Orange County planned and secured permits, public-relations experts went into overdrive, distributing slick educational brochures and videos and giving pizza parties. "If there was a group, we talked to them," says Wildermuth, who recently left Orange County to help sell Los Angelenos on drinking purified waste. "Historical societies, chambers of commerce, flower committees." The central message was health and safety, but the persuaders didn't skimp on buzz phrases like "local control" and "independence from imported water." Last winter, the valve between the sewage plant and the drinking-water plant whooshed open, and a new era in California's water history began.

When I visited the plant, a sprawl of modern buildings behind a concrete wall, in March, Wildermuth, in a blue sport coat and bright tie, acted as my guide. "Quick!" he shouted at one point, mounting a ledge and clinging to the rail over a microfiltration bay. "Over here!" I clambered up just as its contents finished draining from the scum-crusted tank. The sudsy water, direct from the sewage-treatment plant, was the color of Guinness. "This is the most exciting thing you'll see here, and I didn't want you to miss it," he said.